Louisiana Energy Indicators

Center for Energy Studies

Louisiana State University

Summer 1989

Petroleum Prices And Future Drilling Rig Activity

By Wade R. Ragas, Ph.D.

It is an economic principle that supply changes follow price changes in competitive markets. Sustained price increases usually lead to more producers and greater total production. Conversely, price declines usually lead to fewer producers and less total supply within a competitive industry. This article will discuss an industry and a market situation for which the principle fails to apply.

Historically, crude oil and natural gas production have been highly competitive markets within the U.S. Price changes have, in the past, been a good predictor of near-term future drilling rig activity for the past decade.

The charts shown relate the U.S. Petroleum Producer Price Index (PPPI) to the active drilling rig count in Louisiana and the nation, compiled by the "Oil and Gas Journal." All monthly or weekly data have been converted to quarterly averages to remove random variations. The base year for the PPPI shown below is 1967.

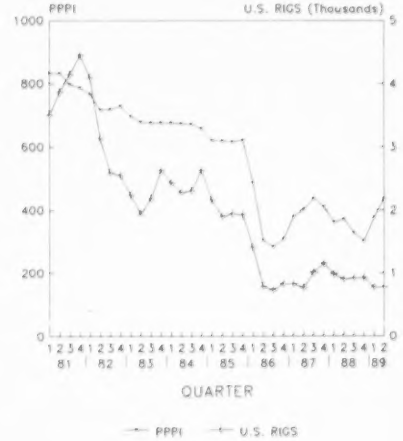
Both U.S. and Louisiana active drilling rig counts closely follow the Petroleum Producer Price Index. For short periods of nine months or less, the trend between drilling rigs and the PPPI may diverge. But in the longer term, price and active rigs move almost in a synchronized way together.

Since the last quarter of 1988, the number of active rigs declined to a relatively low level while the PPPI has risen sharply. A continuation of this pattern of rising price and falling drilling activity would be unprecedented if it continued beyond the third quarter of 1989.

A simple linear regression relating Louisiana active drilling rigs to the PPPI explains 86.4 percent of the actual variation in activity since 1981. Based on the average PPPI in the second quarter of 1989, the average expected active drilling rig count was

PETROLEUM PRODUCER PRICE INDEX AND LA ACTIVE DRILLING RIGS

PETROLEUM PRODUCER PRICE INDEX AND U.S. ACTIVE DRILLING RIGS



Graphs supplied by author

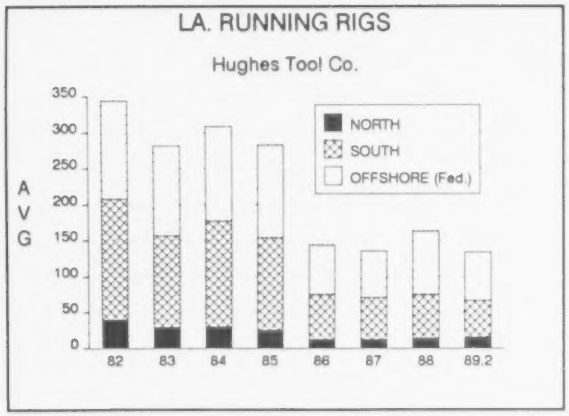
179 for the second quarter of 1989. The actual average was 135 rigs which is over 19 percent lower than expected. This disparity is significantly greater than the expected range of confidence interval from the statistical analysis.

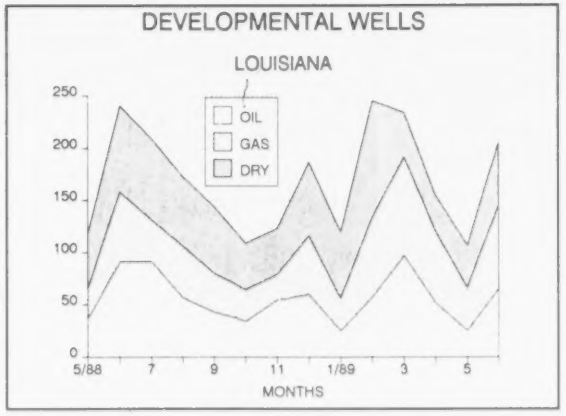
The third quarter PPPI appears to be near the second quarter level with no significant price deterioration evident. Offshore rig activity has behaved in a similar pattern to the onshore count during the 1980s. It, too, should be moving toward recovery.

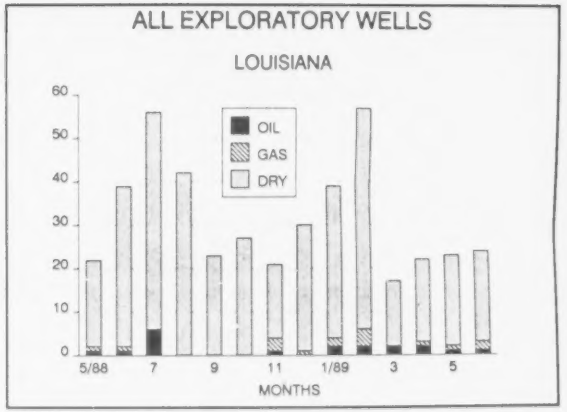
While a recovery to 1985 drilling activity levels of 260 or more active rigs does not appear imminent, a return to 170 rigs on a sustained

Continued on back

Drilling







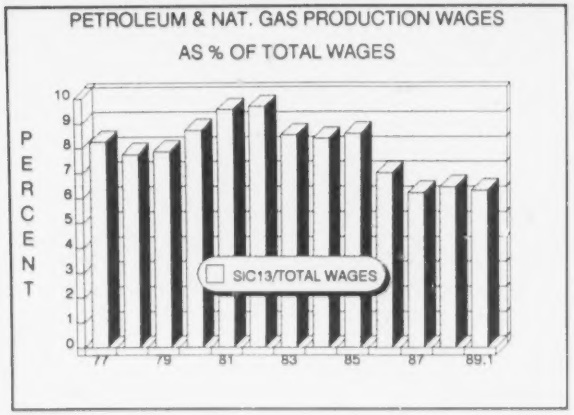
Figures represent TOTAL
except when otherwise noted

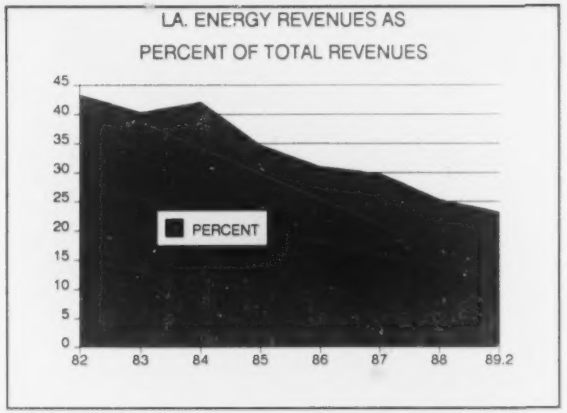
Totals may not add due to rounding

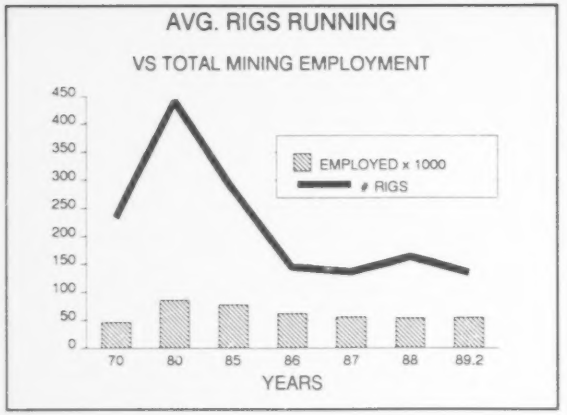
Indicator	1984	1985	1986	1987	1988	88.3	88.4	89.1	Apr	May	Jun	Year to Date Through Last Month Reported June 1988	Year to Date Through Last Month Reported June 1989	% Change
RUNNING RIGS (Avg. Hughes Tool)														
North	30	25	12	12	14	16	16	13	18	16	13	12	15	25.0%
South	147	129	63	59	61	54	14	35	57	52	51	70	52	-25.7%
Offshore (Includes Fed. OCS)	132	129	69	65	88	85	86	69	57	63	73	90	67	-25.6%
EXPLORATORY WELLS - GAS*														
North	8	4	8	12	9	0	4	3	1	1	0	5	5	0.0%
South	8	8	13	5	2	1	1	2	0	0	1	0	3	**
Offshore	13	20	4	12	11	3	3	8	0	0	0	5	8	60.0%
Total	29	32	25	29	22	4	8	13	1	1	1	10	16	60.0%
EXPLORATORY WELLS - TOTAL* (Oil+Gas+Dry)														
North	214	235	116	121	95	19	33	28	5	13	7	43	53	23.3%
South	185	217	149	79	66	19	10	16	3	4	5	37	28	-24.3%
Offshore	166	160	130	164	224	79	33	59	9	5	8	112	81	-27.7%
Total	565	612	395	364	385	117	76	103	17	22	20	192	162	-15.6%
DEVELOPMENTAL WELLS - GAS*														
North	667	710	429	266	248	61	68	98	16	17	35	119	163	37.0%
South	155	232	482	106	128	32	31	48	12	7	7	65	76	16.9%
Offshore	170	203	157	90	142	33	11	55	20	4	25	98	150	53.1%
Total	992	1145	768	462	518	126	110	201	48	28	67	282	389	37.9%
DEVELOPMENTAL WELLS - TOTAL* (Oil+Gas+Dry)														
North	3418	3759	2088	963	913	249	234	195	37	41	84	430	357	-17.0%
South	878	998	825	652	612	146	118	134	26	34	44	348	438	25.9%
Offshore	510	533	459	414	512	131	67	270	92	32	77	314	471	50.0%
Total	4806	5290	3372	2029	2037	526	419	599	155	107	205	1092	1066	-2.4%

*Source: Petroleum Information Corporation. CES maintains additional data in the Indicators Database.
**Since the base quarter (88.2) is zero, this calculation is undeterminable.

Employment, Prices & Revenues







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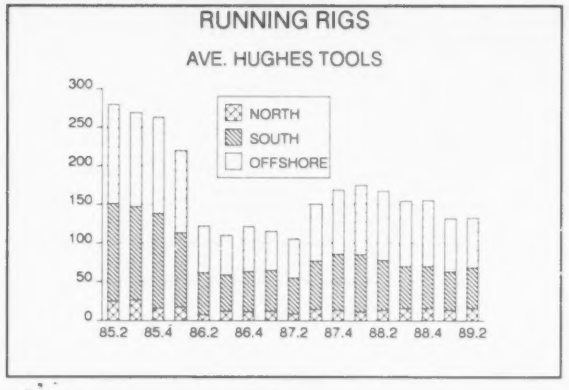
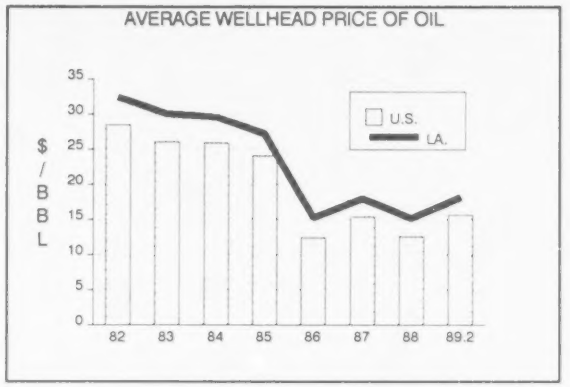
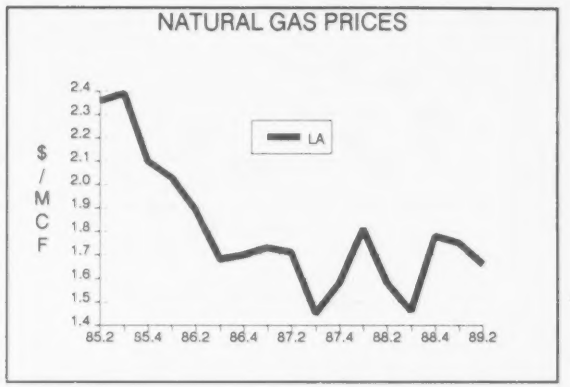
Totals may not add due to rounding

Indicator	1984	1985	1986	1987	1988	88.3	88.4	89.1	Apr	May	Jun	Year to Date Through Last Month Reported June 1988	Year to Date Through Last Month Reported June 1989	% Change
EMPLOYMENT (Thousands) - Avg.														
Oil & Gas Extraction (SIC13)	75.6	77.1	61.9	55.8	53.1	52.2	52.5	54.4	54.5	54.2	54.5	53.8	54.4	1.1%
Chemicals & Allied Products (SIC28)	28.9	28.0	26.1	25.2	26.4	25.9	26.4	27.3	27.4	27.5	27.7	26.6	27.4	3.0%
Petroleum Refining (SIC29)	11.6	11.1	11.5	11.6	10.8	11.4	11.0	10.2	10.1	10.1	10.3	10.4	10.2	-1.9%
Total La. Employment	1751.9	1744.2	1727.3	1728.7	1718.4	1735.4	1731.2	1675.5	1724.8	1717.1	1755.1	1703.4	1703.9	0.0%
OIL PRICES ($/BBL) - Avg.														
Wellhead														
LA	29.67	27.22	15.29	17.98	15.18	14.55	12.95	17.20	19.51	19.15	18.91	16.30	18.20	11.7%
US	25.88	24.09	12.45	15.42	12.55	12.06	10.96	14.54	17.01	16.75	16.40	13.60	15.64	15.0%
Spot (Avg. End of Week)														
W. Texas Int. - Cushing	29.33	27.87	13.39	19.03	15.96	15.14	14.67	18.39	21.06	20.00	20.01	17.01	19.38	13.9%
Louisiana - St. James	29.64	28.42	13.49	19.38	16.12	15.35	14.88	18.79	21.53	20.22	19.41	17.13	19.59	14.4%
GAS PRICES ($/MCF)-Avg.					1.72	1.59	1.93	1.79						
LA Spot Price (Avg.)	NA	2.45	1.75	1.49	~~1.62~~	~~1.49~~	~~1.68~~	~~1.59~~	1.51	1.64	1.67	1.74	1.70	-2.3%
PRINCIPAL ENERGY RELATED REVENUES (Millions $)														
Sev. - Oil & Condensate	653.5	598.3	390.3	345.6	300.0	71.7	57.3	80.3	24.6	28.7	25.0	171.1	158.5	-7.4%
Sev. - Natural Gas	131.3	121.1	126.1	112.7	106.4	26.0	25.2	31.9	7.7	9.1	9.9	55.1	58.6	6.4%
Bonuses	68.0	32.1	15.9	25.5	17.7	3.9	4.8	2.2	1.5	0.9	1.9	9.1	6.5	-28.6%
Rentals	21.2	20.9	12.3	6.7	9.3	3.4	2.7	1.9	0.9	0.4	0.2	3.2	3.5	9.4%
Royalties	436.1	379.1	304.5	253.8	243.2	57.0	60.4	52.2	20.7	21.0	17.6	125.9	111.5	-11.4%
Special Fuels Tax	41.1	52.3	57.6	55.2	58.0	14.9	14.9	13.8	4.3	6.0	4.5	28.2	28.6	1.4%
Gasoline Tax	227.7	286.2	289.5	311.6	314.7	83.8	75.6	76.0	29.1	27.8	23.3	155.3	156.2	0.6%
Nat. Gas Franchise Tax	11.7	11.0	10.9	9.3	9.7	2.4	2.3	2.4	0.4	2.0	0.9	5.0	4.9	-2.0%
Total Energy Revenues	1592.6	1502.9	1211.6	1126.4	1062.6	263.9	244.0	261.6	89.6	96.2	82.8	554.8	530.2	-4.4%
TOTAL STATE REVENUES (Millions $)	**3785.2**	**4335.6**	**3913.2**	**3783.6**	**4181.8**	**983.2**	**1042.3**	**983.4**	**557.6**	**324.1**	**430.3**	**2156.3**	**2295.4**	**6.5%**
ENERGY RELATED REVENUES AS % OF STATE TOTAL	**42.1**	**34.7**	**31.0**	**29.8**	**25.4**	**26.8**	**23.4**	**26.6**	**16.1**	**29.7**	**19.2**	**25.7**	**23.1**	**-10.2%**

Historical Presentation - Rigs & Prices







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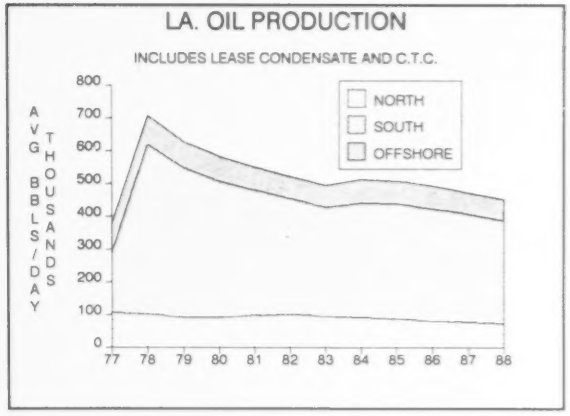
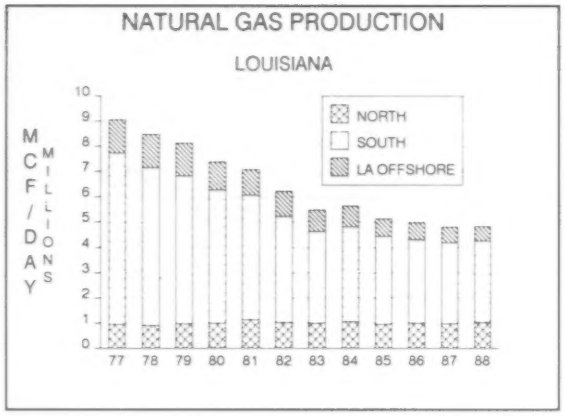
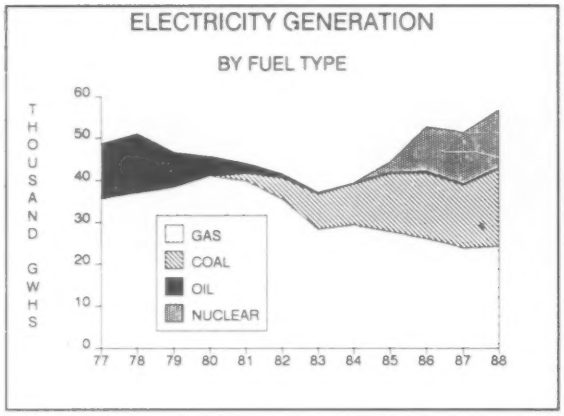
Indicator	83.3	83.4	84.1	84.2	84.3	84.4	85.1	85.2	85.3	85.4	86.1	86.2
RUNNING RIGS (Avg. Hughes Tool)												
North	29	33	32	30	30	29	32	25	26	16	17	7
South	115	141	158	136	137	159	147	126	121	122	96	55
Offshore (Includes Fed. OCS)	110	129	134	120	128	148	141	129	122	125	107	60
Total - LA	254	303	324	286	294	336	320	280	269	263	219	122
Total - US	2149	2578	2445	2253	2408	2611	2198	1867	1923	1914	1464	797
OIL PRICES ($/BBLS) - Avg.												
Wellhead												
LA	29.81	29.98	30.02	29.91	29.84	28.58	26.81	27.26	27.23	27.57	20.71	13.57
US	25.99	26.00	26.01	26.01	26.03	25.47	23.93	24.15	24.00	24.29	17.80	10.70
GAS PRICES ($/MCF) - Avg.												
Wellhead												
LA	2.41	2.51	2.46	2.41	2.49	2.87	2.53	2.36	2.39	2.10	2.03	1.89
US	2.59	2.60	2.68	2.67	2.66	2.60	2.66	2.58	2.47	2.34	2.23	1.97

Indicator	86.3	86.4	87.1	87.2	87.3	87.4	88.1	88.2	88.3	88.4	89.1	89.2
RUNNING RIGS (Avg. Hughes Tool)												
North	12	11	12	8	14	13	11	13	16	16	13	16
South	47	52	53	47	63	73	74	65	54	54	50	53
Offshore (Includes Fed. OCS)	51	59	51	51	74	83	90	90	85	86	69	64
Total - LA	110	122	115	105	151	169	176	168	155	156	132	133
Total - US	724	894	830	768	1002	1146	1001	902	923	922	785	773
OIL PRICES ($/BBLS) - Avg.												
Wellhead												
LA	12.93	13.95	16.98	17.86	19.10	17.95	16.06	16.55	14.55	12.95	17.20	19.19
US	10.04	11.26	14.31	15.40	16.73	15.23	13.33	13.86	12.06	10.96	14.55	16.72
GAS PRICES ($/MCF) - Avg.												
Wellhead												
LA	1.68	1.70	1.73	1.71	1.45	1.58	1.81	1.58	1.46	1.78	1.75	1.66
US	1.78	1.75	1.73	1.66	1.62	1.64	1.98	1.60	1.60	1.73	1.81	1.62

Production & Consumption







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Totals may not add due to rounding

Indicator	1984	1985	1986	1987	1988	88.3	88.4	89.1	Apr	May	Jun	Year to Date Through Last Month Reported June 1988	June 1989	% Change
CRUDE OIL PRODUCTION - Lease Condensate Included (Avg. MBBLS/day)														
North	90.7	87.6	80.5	76.7	73.7	72.8	72.4	69.6	71.1	NA	NA	74.7	NA	--
South	348.0	350.2	345.9	328.0	311.0	305.5	304.9	299.0	297.9	NA	NA	316.8	NA	--
Offshore	74.2	70.0	71.4	66.6	67.2	62.8	65.3	63.2	63.4	NA	NA	70.3	NA	--
Total	512.9	507.8	497.8	471.3	451.9	441.1	442.6	431.8	432.4	NA	NA	461.9	NA	--
NATURAL GAS PRODUCTION - Casinghead Included (Avg. BCF/day)														
North	1.05	0.96	0.99	0.98	1.02	1.02	1.04	1.07	1.06	NA	NA	1.01	NA	--
South	3.76	3.48	3.30	3.20	3.23	3.22	3.29	3.24	3.22	NA	NA	3.19	NA	--
Offshore	0.83	0.70	0.68	0.62	0.59	0.55	0.55	0.53	0.55	NA	NA	0.64	NA	--
Total	5.64	5.13	4.97	4.80	4.84	4.79	4.88	4.85	4.83	NA	NA	4.84	NA	--
COAL-LIGNITE PRODUCTION (Thousand Short Tons)	NR	NR	2254	2774	2889	705	488	685	267	238	150	1506	1344	-10.8%
ELECTRICITY GENERATED (GWH)*														
Gas	29360	27735	26035	23823	24286	8759	4159	3636	1554	2344	2340	11368	9874	-13.1%
Coal	9830	13968	15587	15101	18429	4903	4291	4299	1492	1712	1764	9235	9267	0.3%
Oil	140	100	419	60	269	67	44	29	9	4	3	158	45	-71.5%
Nuclear Power	0	2458	10638	12324	13788	3924	3310	3373	788	815	826	6554	5802	-11.5%
Total	39330	44261	52679	51308	56770	17652	11803	11373	3842	4875	4933	27315	25023	-8.4%

*1GWH = 1 MILLION KWH
NR = Not Collected
NA = Not Available From Source (Office of Conservation, Department of Natural Resources) As of 11/1/89

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basis is consistent with current crude oil and natural gas prices.

The exact cause of rig activity not following the price trend thus far is not clear. The national trend is less affected by the moderate recovery in natural gas prices than Louisiana. However, the national rig count is behaving in a manner nearly identical to Louisiana. In 1985, Louisiana had a 13.59 to 14.7 percent share of the rig count nationally. Today, Louisiana's active rig represents 16.4 percent to 17.5 percent of the national active rigs.

The continued price instability of the past four years and the false price recovery during 1987 have increased the uncertainty level for long-term exploration funding commitments.

The cessation of the Iran-Irag war and change of leadership in Iran is leading other Middle East oil producers to focus on restoring their economies rather than using oil price and supplies as a weapon in the Iran-Irag wars. This analyst believes a period of oil price stability and, possibly, further increases lies ahead.

While the weak recovery described here is not a return to the growth period of 1978 to 1981, it is the beginning of a long recovery for this vital industry.

Dr. Wade R. Ragas is a professor of finance and the director of the Real Estate Market Data Center at the University of New Orleans.

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Intrastate Natural Gas Prices

Petroleum Information Corporation (Unpublished data.)
Wells Completed
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